City of Alexandria
Transportation Planning Administrative Guidelines

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Section 1 - Introduction

The City of Alexandria envisions an integrated, multimodal transportation system that is accessible and safe for all users. For Alexandria to maintain its attractiveness as a place of residence and commercial destination, traffic impacts associated with new development must be minimized. City government recognizes that one's ability to move through and about the City affects both quality of life for residents and commercial growth potential. Given this, all new development projects projected to generate at least 50 peak hour vehicle trips must submit a multimodal transportation study for staff review. Multimodal transportation studies examine existing and future traffic, transit service, parking, and pedestrian and bicycle conditions. The depth of a required study is based on the net number of vehicle trips a proposed development creates during its peak hour(s) of operation.

City staff use multimodal transportation studies to optimize the mobility of pedestrians, transit users, bicyclists and drivers. Study results help staff determine whether or not the City's existing transportation infrastructure and services can support a proposed development. If a study suggests that a proposed development will impact mobility, staff uses the study to determine and justify the measures necessary to mitigate such impacts. This may include physical capital improvements or on-going programmatic measures per the City's Transportation Management Plan Special Use Permit process as defined by Section 11-700 of the Zoning Ordinance. After working with an applicant to determine any necessary mitigations, staff makes subsequent recommendations to the City's Planning Commission and City Council.

Per Section 11-709 of the Zoning Ordinance, the following Guidelines provide technical procedures to analyze and report the effects of new development on transportation facilities in Alexandria. The Guidelines are intended to standardize the submittal requirements and evaluation systems employed to provide a comprehensive analysis of the impacts of a proposed development. Beyond typical DSUP applications, the Guidelines also detail the technical procedures used to analyze traffic impacts for Coordinated Development Districts and Small Area Plans.

Process Overview for Multimodal Transportation Studies Required of Standard DSUP Projects
The Guidelines apply to development projects subject to the site plan review process as defined in the Zoning Ordinance, Section 11-400. For typical Development Special Use Permit projects (DSUPs), the review of such projects for transportation matters is conducted concurrently with the site plan review process.

Review Stage	Steps
Concept Stages	**Step 1:** Prior to its first submission, an applicant may choose to contact the Department of Transportation and Environmental Services' Division of Transportation to discuss potential requirements for a transportation study. If desired, the applicant may coordinate with staff on the screening worksheet during this call or meeting, or may choose to fill out this sheet separately.
	Step 2: All applicants must submit a Transportation Screening Worksheet with any Concept 1 phase submission. Based on the information contained in the worksheet, T&ES staff will use the development thresholds as set forth in this document to determine if the applicant is required to submit a Transportation Management Plan Special Use Permit and/or a Multimodal Transportation Study, or if no further action is required.
	Step 3: If the applicant is required to submit a TMP or multimodal transportation study, the applicant must submit a draft version of the scoping form to T&ES Traffic Engineering Division during the Concept 2 phase of the site plan process. The form must document all proposed methodology and elements to be used in the transportation study, such as data sources,

	assumptions, trip generation, trip distribution, and mode share, and must be submitted to the Traffic Engineering Division of T&ES for approval.
	Step 4: Upon submittal of the draft scoping form, the applicant schedules a scoping meeting with the Traffic Engineering Division of T&ES.
	Step 5: The applicant and City staff review, confirm, and/or edit assumptions listed on the draft scoping form.
	Step 6: Based on coordination at the meeting, the applicant prepares a final scoping form for approval by the T&ES Traffic Engineering Division. This agreement outlines the required contents of the transportation study and agreed to assumptions. The agreement should be signed by the City and the applicant, and should be included in the appendix of the transportation study. The agreement should note any agreed timing associated with submission. Generally speaking, staff requires that the transportation study be submitted two weeks prior to the applicant's verification of completeness submission. T&ES may require the study to be submitted earlier, depending on the project's extent. Submission timing will be discussed and agreed upon at the scoping meeting based on the magnitude of the project. At the scoping meeting, staff will also provide the applicant with a tabular format for data input for existing traffic counts and any relevant parking studies. All survey data must be entered and provided to staff electronically with the submission of the transportation study.
Completeness & Preliminary Stages	**Step 7:** The applicant submits the following materials to the development case's primary planner: • (7) seven hardcopies of the study (2 for Planning and Zoning, 1 for Transportation Planning, 1 for Transit, and 1 for Traffic Engineering) • (1) one electronic copy of the study for upload • A thumbdrive, CD, or other electronic media with existing traffic counts and parking occupancy information. Timing for the submission shall be aligned to the timing agreed upon at the applicant's scoping meeting, as documented in the applicant's scoping form. The transportation study will be routed to the appropriate parties for review.
	Step 8: T&ES reviews the transportation study concurrently with the verification of completeness submission and requests any necessary revisions from the applicant prior to the preliminary plan's submission. While mitigations are not technically finalized until the preliminary plan's approval by the City's public bodies, proposed mitigations—including non-vehicular improvements—should be reflected in the transportation study.
	Step 9: After incorporating any requested revisions (if necessary) the applicant submits a revised transportation study to the case's primary planner. The transportation study will be routed to the appropriate parties for review. If the electronic existing counts or parking occupancy counts required revision, these items will also need to be resubmitted.
	Step 10: Following a final review of the transportation study, T&ES will prepare conditions for inclusion in the staff report. Conditions are designed to address the transportation issues and concerns noted in the transportation study.
	Step 11: Approving bodies review and take action on the development application. If a study was conducted for a project site and there is updated information that would impact the transportation network or modify the transportation study in any way, the applicant will be required to resubmit an updated transportation study before approval by Planning Commission and Council. An update memo may be accepted by the City with prior approval by the Director of T&ES.

Circumventing the threshold by submitting piecemeal development applications is not permitted. If the applicant submits a new development application at an adjacent location within a five-year period of the initial

submission, T&ES will direct the applicant to perform a new transportation study that includes all trips generated by all applications within the last five years.

Multimodal Transportation Studies
While the technical requirements of these Guidelines generally apply to multimodal transportation studies required of Coordinated Development Districts (CDD) and Small Area Plan (SAP) planning processes, there are a few important differences.

SAP and CDD plans typically lay the groundwork for subsequent DSUPs. SAP and CDD plans are typically performed at a more conceptual level than DSUPs. Information regarding specific development site programming, including details on site layout, access, and circulation, may not be available at the SAP and CDD stages, or may change between SAP/CDD approvals and DSUP reviews. Consequently, the agreements established at the scoping meeting for SAP and CDD plans will likely differ from those established at scoping meetings for DSUP projects.

A CDD differs from a DSUP in that a CDD includes a number of parcels and properties—sometimes even including properties not owned by an applicant. A CDD locks in certain elements such as land use, a street framework, or the phasing of a development area. A CDD applicant must submit a multimodal transportation study through the typical application process detailed above. Unless otherwise determined by the Director of Transportation and Environmental Services through a memorandum of understanding (as detailed below), a CDD's transportation study shall not function as a substitute for subsequent transportation studies provided with DSUP applications for the following reasons:

- Various DSUPs within a CDD may not be ready for immediate development; site environment and background conditions may have substantially changed.
- Staff may need to assess intersections that were not originally included within the scope of the CDD study—particularly internal intersections.
- Mitigations and phasing assumptions that are developed through the SAP or CDD processes should be reassessed at the DSUP stage as finer detail becomes available regarding use, road network, garage entryways, etc.
- Property owners not involved with the initial multimodal transportation study process may benefit from the opportunity to select their own consultants and directly coordinate with staff.

The SAP process is driven by City staff—often in coordination with property owners. SAP transportation studies aim to support City planners' understanding of appropriate densities within a given planning area. Multimodal transportation studies generated through the SAP process are typically more conceptual in nature and less detailed than those required at the DSUP stage. Unless otherwise determined by the Director of Transportation and Environmental Services through a memorandum of understanding (as detailed below), a multimodal transportation study completed through the SAP process shall not fulfill the requirement of a transportation study at the CDD or DSUP levels.

Memorandum of Understanding of Transportation Study Requirements
The City anticipates that some property owners will request consent from the Director of Transportation and Environmental Services to eliminate the transportation study requirements at the DSUP application stage in cases where studies have been recently completed in support of SAPs or CDD applications. In such cases, applicants should anticipate this request prior to the initiation of the associated CDD or SAP study. Applicants shall draft a Memorandum of Understanding, to be signed by the applicant and the City, detailing the applicant's study requirements. Unless if a prior agreement has been established through an MOU, an applicant will not be permitted to forgo associated DSUP multimodal transportation studies.

The MOU shall, at minimum, address the following:

- justification of why the DSUP transportation study or studies are not needed
- the agreed on scope of the larger CDD or SAP study, to include:
    - all intersections/blocks to be studied[1]
    - all study assumptions
- timing for all SAP approvals or development applications relevant to the request
- agreement that, should staff deem improvements necessary at the DSUP stage that are not identified in the CDD/SAP study, these may be conditioned at the DSUP stage
- any phasing or timing requirements that would invalidate the MOU

Scoping Meeting

The purpose of the scoping meeting shall be to 1) determine the scope of the transportation study and/or other addendum studies (e.g. parking study) as needed, 2) determine the submission timing for the transportation study, and 3) allow the City and applicant to discuss requirements, methodology and any special considerations which may exist prior to the commencement of work. If a transportation study is required, the applicant and/or their transportation consultant shall submit a draft scoping form prior to the scoping meeting. The Transportation Scoping Form (Appendix B. 2.) is the template for the scoping form and includes all subject matter to be addressed in the transportation study, including but not limited to:

- proposed uses
- mode share
- internal trip capture
- trip distribution percentages
- peak hour of operation
- submission timing

Mode share and internal trip capture percentages have the potential to greatly impact modeling scenarios. Additionally, mode share and internal trip capture are not static, but may change over time based on anticipated public improvements or transportation trends. Any proposed mode shares and internal capture rates will be scrutinized by City during the scoping meeting. Applicants should be prepared to justify these assumptions using documentation and processes consistent with guidance from the Institute of Transportation Engineers (ITE) or the Transportation Research Board (TRB).

Based on the discussion at the scoping meeting, the consultant will revise the draft scoping form for the transportation study prior to beginning work. The agreement is to be signed by both parties before work commences to document all of the assumptions to be included in the study. The City will provide comments to the consultant through the existing development review process. Comments on studies submitted prior to completeness will be packaged for the applicant with the verification of completeness set of comments. Comments on revised studies will be provided to applicants packaged with comments on any preliminary plan.

Future Updates

These Guidelines are not static. The City will review and revise the Guidelines as necessary. Future updates may re-examine the City's requirements as best practices and industry standards progress. The City also intends to revisit these Guidelines as warranted by changes to societal preferences or technological innovation in land

[1] Intersections and streets must be specifically identified in the agreement. Phrasing such as "internal intersections" will not be accepted. In cases where the applicant proposes new streets, graphic identification may prove beneficial.

development, transit, shared-ride, and delivery service economies, and the automobile marketplace. Many emerging trends, such as economic indicators, changing preferences, and the advent of autonomous vehicles will have an evolutionary effect on travel and infrastructure needs. None of these trends have a certain enough outcome at this time to influence a change to the transportation impact analysis process; however, the City expects to take a proactive approach to such trends as evidence materializes.

Section 2 – Overview of Study Requirements & Appropriate Resources

This chapter provides technical guidelines to analyze and report the effects of new development on multimodal transportation facilities in Alexandria. This chapter describes the standardized submittal process and reporting requirements to provide a comprehensive analysis of impacts related to development proposals and proposed mitigation strategies.

Study Thresholds

The requirement to complete a multimodal transportation study is established through these Guidelines per section 11-709 and 11-704 of the Zoning Ordinance. The table shows the thresholds of the development size categories based on peak hour vehicle trips.

Peak Hour Trips*	Documentation Required	Development Size Category
DSUP <50	N/A	N/A
DSUP 50-99	Multimodal Transportation Study	Small
DSUP 100-249	Multimodal Transportation Study	Medium
DSUP >249 all CDDs and SAPs	Multimodal Transportation Study	Large

Peak Hour

Generally, staff expects that the applicant's requirement to complete a study shall be based on conditions associated with the peak hour of the adjacent roadway in the AM or PM, whichever is greater; however, City staff retains the flexibility to account for variation based on use and transportation trends. Staff also retains the flexibility to direct the applicant to use a specific resource/land use code to assess trip generation for the purposes of determining whether or not a threshold is met.

For purposes of determining the study thresholds, the City uses unfactored vehicle trip generation rates as indicated on the Scoping Intake Form. The unfactored rates do not include discounts for pass-by trips or site-specific assumptions regarding mode splits, etc. Existing trips for currently occupied developments may be credited so that the study thresholds reflect net new vehicle trips to the site. Existing trips should be established through either the use of unfactored standard ITE rates or equations consultation with the City.

Study Areas

Each development size category has a corresponding study area relative to the size of the potential impact. The transportation study will cover each mode of transportation with different methods; therefore, some modes will have a unique study area based on the characteristics of that mode. The study area will be finalized at the scoping meeting by the Director of T&ES. The study areas are defined in the table below.

Study Area Guidelines by Development Size Category

Distances shall be measured from the site perimeter—distances shall *not* be measured from a site centroid.

<table>
<tr><th>Size</th><th>Vehicular Study Area</th><th>Transit, Bicycle and Pedestrian Study Area</th><th>Parking Study Area</th></tr>
<tr><td>Small</td><td>At a minimum, include all site driveways and intersections within 1000 feet radius OR one signalized intersection in each direction, whichever is greater.</td><td>Streets adjacent to site</td><td>Streets curbs adjacent to and across from site, limited to the lesser distance of 1 block or 300 feet.</td></tr>
<tr><td>Medium</td><td>At a minimum, include all site driveways and intersections within one-quarter mile radius OR three signalized intersections in each direction, whichever is greater.</td><td rowspan="3">Area within one-quarter mile walkshed of the site</td><td rowspan="3">Two block radius OR 1,000 feet radius, whichever is less.</td></tr>
<tr><td>Large

DSUP Studies</td><td>At a minimum, include all site driveways, internal intersections, and intersections within a one-half mile radius OR four signalized intersections in each direction, whichever is greater.</td></tr>
<tr><td>Large

CDD and SAP Studies</td><td>Include all major gateways into the site and major intersections within a one-half mile radius OR four signalized intersections in each direction, whichever is greater. Study intersections are to be determined at the scoping meeting and may/may not include internal intersections, depending on context.</td></tr>
</table>

Required Analyses and Horizon Years
At minimum, the following analyses shall be required based on the required study size.

DSUP applications without multiple phases:

1. Small and medium developments - Applicant is required to perform a-d.
    a. Existing conditions
    b. Opening year analysis without subject development
    c. Opening year analysis with subject development
    d. Opening year analysis with subject development and mitigation (if necessary)

2. Large development – Applicant is required to perform a-g.
    a. Existing conditions
    b. Opening year analysis without subject development
    c. Opening year analysis with subject development
    d. Opening year analysis with subject development and mitigation (if necessary)
    e. Opening year plus six years analysis without subject development
    f. Opening year plus six years analysis with subject development
    g. Opening year plus six years analysis with subject development and site mitigation (if necessary)

DSUP applications with multiple phases:

1. Small and medium developments: applicant is required to perform a-h.
    a. Existing conditions
    b. Phase one opening year analysis without subject development
    c. Phase one opening year analysis with subject development
    d. Phase one opening year analysis with subject development and mitigation (if necessary)
    e. Phase two opening year analysis without subject development
    f. Phase two opening year analysis with subject development
    g. Phase two opening year analysis with subject development and mitigation (if necessary)
    h. Continue e-g for each phase.

2. Large developments: For large developments, six years after final phase is complete should not to exceed 25 years from project initiation. If it does exceed 25 years, then 25 years from project initiation shall be reviewed. Flexibility for scenarios may be granted due to context. Additional scenarios may be required if more than two phases are proposed.
    a. Existing conditions
    b. Phase one opening year analysis without subject development
    c. Phase one opening year analysis with subject development
    d. Phase one opening year analysis with subject development and mitigation (if necessary)
    e. Phase two opening year analysis without subject development
    f. Phase two opening year analysis with subject development
    g. Phase two opening year analysis with subject development and mitigation (if necessary)
    h. Phase two opening year plus six years analysis without subject development
    i. Phase two opening year plus six years analysis with subject development
    j. Phase two opening year plus six years analysis with subject development and mitigation (if necessary)

The horizon year(s) should be related to the opening date of the proposed development or build-out of major phases of a multi-year development or long-range transportation plans or other significant transportation network changes. Horizon years will be established during the scoping process.

For SAP and CDD studies, the requirements of any established MOUs will supersede the above requirements, when applicable. For any studies impacting a state road, VDOT requirements are applicable, and study requirements may be adjusted as necessary.

Mitigation and Conditions

The City strives to maximize the utilization of prior investments in roadway capacity and supports a multimodal vision per its approved Transportation Master Plan. To this end, the City recognizes that improvements supporting increased vehicular capacity sometimes come at the expense of the travel experiences of pedestrians, bicyclists, and transit users; therefore, decisions about right-of-way design and operations must balance the needs for users of all modes. The City may examine potential mitigations to improve substandard mobility conditions with consideration of the quality of service provided for all modes of travel. Requested mitigations will help the City balance the needs of all users to provide safe and efficient travel.

For conditions developed in association with CDD applications or SAP rezoning approvals, the applicant should note that the City retains the right to condition subsequent DSUP applications based on additional information made available through any multimodal transportation studies developed during the DSUP review process.

Resources

All methodology data sources used should be well documented in the transportation study. The latest edition of each of the sources listed below are typically acceptable, but require approval through coordination with staff. Sources not referenced in the Guidelines may be approved by the Director of T&ES or his designee and will be determined in the scoping process. The following resources may be used as sources:

A. City Approved Studies
B. Field Observations
C. Urban Land Institute, Shared Parking Second Edition, 2005
D. Institute of Transportation Engineers Trip Generation, 9th Edition, 2012
E. Institute of Transportation Engineers Transportation Planning Handbook, 4th Edition, 2016
F. Institute of Transportation Engineers Trip Generation Handbook, 3rd Edition 2014
G. Washington Metropolitan Area Transit Authority 2005 Development Related Ridership Survey
H. American Community Survey 5-year samples and Decennial Survey
I. Metropolitan Washington Council of Governments, Transportation Travel Demand Model, version 2.3
J. Metropolitan Washington Council of Governments regional land use Cooperative Forecasts
K. Virginia Department of Transportation (VDOT) Average Daily Traffic (ADT) volumes from dated no more than two years prior to the current calendar year.
L. Transit agency approved data from Washington Metropolitan Area Transit Authority (WMATA), DASH, Fairfax Connector, ART, PRTC, etc.

Additional Reference Material

The City strongly encourages applicants to reference City approved materials detailed below. The following plans contain additional guidelines and assumed improvements that the applicant may be asked to consider/employ for multimodal transportation studies.

A. Small Area Plans and Associated Transportation Studies and/or Appendices
B. 2016 Pedestrian and Bicycle Master Plan
C. 2016 Complete Street Design Guidelines
D. Bicycle Parking Standards
E. Alexandria's Capital Improvement Plan
F. Alexandria's Long Range Plan
G. Transportation Master Plan
H. VDOT Chapter 527 Guidelines, where relevant

Section 3 – Vehicular Transportation

Introduction
This section defines the elements that are required for the vehicular traffic impact analysis component of a multimodal transportation study. A thorough study shall address each of the items discussed in the following sections.

Study Area
The documentation should provide a description of the proposed site improvements, existing zoning and use, and proposed zoning within the study area. Anticipated land uses in the general vicinity of the site should be identified in order to understand other factors influencing the study area.

The local base map should include, but not be limited to:
A. The street system with names of all streets in the study area
B. Study intersections numerically marked
C. Shading of the study area
D. Shading of the site with the boundary outlined
E. Map should be to scale
F. North arrow

Study intersections will be determined during the scoping process. Any existing site access is guaranteed to be a study intersection.

Where build-out roadway and intersection configurations are different in future conditions from existing conditions, they must be based on approved infrastructure projects as determined by the City and agreed upon at the scoping meeting.

Data Collection
The traffic data in the transportation study should be less than one year old at publication provided that no major geometric changes or traffic control changes have been implemented. The applicant may request approval to use older traffic data. In the cases when such is appropriate, approval may be granted by the Director of T&ES or his appointee during the scoping process. Data collection should be conducted when schools are in session. Counts may not be taken on Federal holidays or the day before or after a Federal holiday.

All study intersections within the study scope should have full turning movement counts for vehicles, pedestrians, and bicyclists. For typical uses, traffic counts should be conducted Tuesdays through Thursdays for a three-hour morning peak period between 6:30 and 9:30am and a three-hour evening peak period between 4:00pm-7:00pm and should be summarized by 15 minute periods to identify peak hour.

Some uses such as churches, bars, and tourism establishments generate demand at atypical hours. The City retains the flexibility to shift peak hour requirements based on location and/or use. Additionally, the City retains the flexibility to require applicants to collect and provide data on and additional weekend peak period, as warranted by the project's use. Any additional peak requirement will be determined and agreed upon at the scoping meeting.

Existing Conditions
Existing peak hour intersection and intersection LOS, queue lengths and delay should be determined for all intersection movements within the study area based on the procedures described in the most current edition of the Highway Capacity Manual. Analysis of existing conditions should use the existing traffic signal timing and phasing.

Trip Generation, Internal Capture & Modeshare
The most recent version of the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition or the COG regional model are to be used as the primary sources for trip generation rates, or other as approved during the scoping process. When using the ITE Trip Generation Manual, use of the formulas is preferred. Trip Generation rates may be used in instances where formulas are not available, or where the formula does not accurately fit the development levels. Refer to ITE Trip Generation Manual guidance on the appropriate application of trip generation rates.

Any reduction for pass-by trips or internal capture will require approval by T&ES during the scoping process. Pass-by trips and internal capture will require a demonstration of how the figures were derived. The burden of justification for an internal capture rate falls on the applicant. While ITE may be acceptable, staff encourages—and may require—the applicant to collect data from local sites of similar use to justify internal capture rates if deemed appropriate by the Director of T&ES or his/her designee. The final internal capture rate shall be agreed upon during the scoping meeting and shall be approved at the discretion of the Director of T&ES or his/her designee.

If the new development is located within the vicinity of a high volume transit station, reasonable vehicle trip reductions may be made with T&ES approval. The burden of justification for a mode share assumption falls on the applicant. Staff encouragesthe applicant to collect data from sites of similar use and vicinity or use references such as the MWCOG travel demand model to justify mode splits if deemed appropriate by the Director of T&ES or his/her designee. The final modeshare shall be agreed upon during the scoping meeting and shall be approved at the discretion of the Director of T&ES or his/her designee.

Trip Distribution
Trip distribution should be based on regional modeling, origin-destination studies, existing traffic flows, applied census data or other methodology approved by the Director of T&ES. Procedures and logic for estimating the trip distribution should be well documented. Site traffic trip distribution should be depicted as percentages on inbound and outbound directional distribution map. Trip distribution should be determined during the scoping process and shall be approved at the discretion of the Director of T&ES or his/her designee.

Analysis Methodologies
Studies should include an analysis of each approach to the intersection being evaluated. Analysis methodologies should include the Highway Capacity Manual (HCM) and VISSIM, as determined based on context per coordination at the scoping meeting. To evaluate the potentially appropriate software, the applicant will employ VDOT's Software Selection Tool (SST) and provide results during the scoping meeting. Per VDOT's Traffic Operations and Safety Analysis Manual, the SST may assist users in selecting the appropriate traffic operations by considering the functionality and capability of various analysis products; however the ultimate decision regarding the appropriate software tool to use given the characteristics of the project and study area will be determined during the scoping meeting.

HCM: The HCM methodology should be used on all small and medium sized projects and for large projects where all signalized intersections have a V/C ratio of less than 0.85. V/C ratio can be calculated using HCM or the Critical Movement Summation (CMS) method. Synchro or Vistro files will be provided by the City if available.

VISSIM: VISSIM is a micro-simulation program used to analyze multi-modal traffic flow. The City requires the use of VISSIM in certain cases because VISSIM has the capability to analyze the impacts of queue spill-over on the network as well as the impacts of transit vehicles and buses. Unless otherwise determined by the Director of Transportation and Environmental Services of his/her appointee at the scoping meeting, all intersections should be analyzed using VISSIM if either of the following exists:

1.) the project meets the large study threshold and a dedicated transitway is part of the analysis—including planned or future service; or
2.) the project meets the large study threshold and the study area includes interstate highway access.

The peak hour factor (PHF) should be calculated by approach for existing conditions based of the traffic data collected. Future PHFs should be the higher of 0.92 or the existing approach PHF.

The percent of heavy vehicles should be determined from the traffic data collected. In cases where a roadway facility with a large number of heavy vehicle traffic is influenced by an existing land use that is proposed to be replaced by a different use, the percent of heavy vehicles on the roadway should be calculated by subtracting the heavy vehicles generated by the current land use from the heavy vehicles measured on the roadway.

VISSIM Calibration

The VISSIM traffic model must be calibrated for existing conditions prior to performing any analysis. The objective of model calibration is to obtain the best match between model performance estimates and field measurements. Model outputs are compared against field data to determine if the output is within acceptable levels.

For each scenario a minimum of five VISSIM model runs are required for each calibration run. The calibration requirements for the VISSIM simulation are summarized below and should be provided in the appendix of the study.

Criteria and Measures	Calibration Acceptance Targets
Modeled link volumes less than 700 vph	Within 100 vph of field measurements
Modeled link volumes from 700 to 2700 vph	Within 15% of field measurement
Modeled link volumes greater than 2700 vph	Within 400 vph of field measurements
Sum of all modeled link flows	Within 5% of sum of all link counts
Modeled travel times	Within 15% of observed travel times
Modeled maximum queue lengths	Within 30% of observed queue lengths

The following VISSIM parameters may be adjusted for the purposes of calibration to observed conditions:

- Desired Speed
- Lane changing behavior (Urban driver)
    - Emergency stop distance
    - Lane change distance
- Car following behavior (Urban driver)
    - Average standstill distance
    - Additive part of safety distance

Background Development

Background traffic should be representative of the horizon year(s). Background traffic volumes should be estimated by including the following elements:

- Known pipeline developments: this should account for all relevant approved projects within one mile of the study area or other major developments identified through the scoping process.
- MWCOG Cooperative Forecast Data (most recent addition) generally only for study horizon years more than 10 years in the future

Regional Traffic Growth
Regional growth should be based on regional modeling, existing traffic flows, and the MWCOG Cooperative Forecasting data. This is determined through analysis of historical trends in the region, such as using historical VDOT count data or COG model data. A minimum of five years of historical count data should be used when determining growth rate. In order to avoid double-counting traffic growth, regional growth may be prepared and compared against the traffic growth related to pipeline developments. Regional growth may be reduced or eliminated from consideration based on the volume of pipeline traffic. Both the regional and ambient growth rates used in the transportation study will be approved during the scoping process. Procedures and logic for estimating regional growth should be well documented in the study.

VDOT Chapter 527 Compliance
In 2006, the General Assembly directed the VDOT Commissioner to develop and implement traffic impact analysis regulations for development proposals that will affect state highways (Chapter 527). The Traffic Engineering Division will be responsible for determining if the project requires a state mandated Traffic Impact Analysis per Chapter 527. The determination will be made no later than the scoping meeting held by the Traffic Engineering Division with the applicant.

If a State Traffic Impact Assessment is required of the applicant, a coordination meeting will be held between Traffic Engineering Division and VDOT along with the applicant and its engineer. After the meeting, the applicant will send out the VDOT scoping form for VDOT and City approval.

All fees associated with this review process should be the amount required by VDOT and should be in the form of check paid by the developer. The required fees along with a complete submittal package will be submitted to the City for completeness. Upon findings of completeness, the application will be submitted to VDOT by the City for review and action.

This process will comply with all the requirements of the VDOT “Traffic Impact Analysis Regulations Administrative Guidelines, 24 VAC 30-155”. The regulations can be found at:
http://www.vdot.virginia.gov/info/traffic_impact_analysis_regulations.asp

Section 4 – Transit

Introduction

An applicant must perform due diligence to identify existing transit and shuttle services as well as project any impacts to the transit system with the new development. The City's goal is to increase the use of existing and planned transit and private shuttles. Study areas for transit analysis and reporting—as previously defined in the Guidelines—are as follows:

- Small developments – streets adjacent to site
- Medium and Large developments - ¼-mile walkshed radius of the site

For CDD and SAP multimodal transportation studies, an applicant should coordinate with the Transit Services Division to determine whether or not there are any additional specific requirements of the applicant in regards to public transit. Any specific concept and needs will be determined and agreed upon at the scoping meeting.

Transit Analysis - Existing and Planned Conditions

The transportation study should include a review of existing and planned transit conditions including the services and infrastructure available in the study area in text format. This should include the following:

Service Review - All public transit bus, public and private shuttles, and public transit rail routes within the study area as defined by the vehicular study area.

- Operator
- Private shuttles which are part of an adjacent TMP (contact Transit Services Division TMP coordinator for more information)
- Service type/mode and name of the route
- Destinations of public transit routes
- Location of all public transit stops in the study area
- Span of Service and the frequency of all public transit during peak and non-peak hours
- Existing ridership at all public transit bus and rail stops within and across from the study area.
- A list of planned service changes (including reductions or improvements, or when applicable, future new service [e.g. transitways, new metro stops, etc]).

Infrastructure Review - All transit infrastructure within the study area including, but not limited to bus stops and bus shelters, stations, transit stations, benches, real-time transit information LED signs, etc.

- List of existing infrastructure
- Conditions of existing infrastructure
    - ADA compliance
    - Structural conditions (rust, cracks, graffiti, paint chips, pad conditions, etc.
    - Bus stop pole and flag condition (updated and/or correct information, graffiti, stickers, etc.)
    - General accessibility (including ped/bike accessibility)
    - Any planned capital improvements that will impact transit ridership

The list of existing and planned conditions should be keyed to a map depicting all stops, routes, and planned improvements. The applicant should also include a graphic noting proposed upgrades to be provided by the development. Supporting text and photos are encouraged, especially to document deficiencies requiring attention. To coordinate on planned facilities or information about existing Transportation Management Plans, please contact the Division of Transit Services.

Section 5 – Bicycle and Pedestrian

Introduction

It is a goal of the City of Alexandria to create an integrated, multimodal transportation system that is accessible and safe for all users, including pedestrians and bicyclists. An applicant must analyze how a given development can support this goal, thereby reducing dependency on vehicular travel. Study areas for pedestrian and bicycle analysis and reporting—as previously defined in the Guidelines—are as follows:

- Small developments – streets adjacent to site
- Medium and Large developments - ¼-mile walkshed radius of the site

Bicycle and Pedestrian Analysis – Existing and Planned Conditions

The applicant should collect data and report conditions for the following features within the study area:

- Pedestrian and bicycle intersection peak hour count data (medium and large studies only)
- Complete Street Typologies (existing & proposed [when relevant])
- Trails
- Existing sidewalks (including detail on the width and physical condition)
- Missing sidewalks
- Pedestrian and bicycle bridges and tunnels
- Crosswalks (including detail on the type, width and physical condition)
- Curb ramps that do not meet current ADA and City standards
- On-street bicycle facilities (i.e., Pedestrian and Bicycle Mobility Plan designated route, bicycle lane, sharrows, cycle track)
- Off-street bicycle facilities (shared-use path)
- Pedestrian and bicycle level of service, when available
- Demand paths (a.k.a. “people’s choice paths”, “desire paths”, or “goat paths”)
- Transit stops and amenities
- Pedestrian-scale lighting
- Bikeshare stations
- Intersections with pedestrian countdown signals (including details on phasing elements that impact pedestrian comfort)
- Intersections without pedestrian countdown signals
- Intersections with pedestrian countdown signals that do not appear to be ADA compliant
- Bicycle parking with capacity
- Planned bicycle facilities per the 2016 Pedestrian and Bicycle Master Plan network
- City Planned capital improvements and/or Complete Streets projects.
- Applicant planned capital or facility improvements (e.g. proposed sidewalk extensions, curb ramp or crosswalk upgrades, bikeshare locations, etc.; please refer to the City’s Complete Streets Design Guidelines for City standards)

For medium and large studies where peak hour count data is required, the applicant shall only will make their best efforts to collect data on days in which the climate is suitable for pedestrian and bicycle activity. While staff prefers that data not be collected on cold days, data collection may be permissible in the winter for the sake of practicality.

The list of existing and planned conditions should be keyed to a map depicting all relevant items. Supporting text and photos are encouraged, especially to document deficiencies requiring attention. The applicant should also include a graphic noting proposed upgrades to be provided by the development. Supporting text and photos are encouraged, especially to document deficiencies requiring attention.

Section 6 – Parking

Introduction

The City of Alexandria's goal is to approve developments with an adequate amount of parking to support new development while discouraging single occupancy vehicle driving and to prevent spillover into adjacent communities. All proposed developments must provide baseline parking information to support their application, even in the event a parking modification is not requested.

In this section of the multimodal transportation study, the applicant should indicate whether or not it plans to satisfy the requirements of the Zoning Ordinance. If a modification to the Zoning Ordinance requirements are requested in the development application, then further documentation must be provided to demonstrate that the parking supply for the development will not cause adverse impacts. This chapter explains the necessary documentation needed to assist staff, the Planning Commission, and City Council in determining if the parking provided is sufficient.

Small development projects may conduct required parking analyses without the use of a professional consultant. Medium and large projects shall collect on-street parking occupancy data, and—when seeking a modification from the Zoning Ordinance—should provide comparable examples of sites with similar parking ratios.

For any parking modification, a proposed parking management plan should be submitted by the applicant with the preliminary plan.

Study Area

For small studies not requiring professional services, the study area shall include all street curbs adjacent to and across from the site, limited to the lesser distance of one block or 300 feet. The study area for medium and large studies is the lesser of two blocks or 1000 feet from the outside perimeter of the site. The City maintains the flexibility to modify the study area based on site context. The study area will be finalized and agreed upon at the scoping meeting.

Parking Analysis – Existing Conditions

The multimodal transportation study should document existing conditions, including an analysis of on-street parking conditions, existing posted parking restrictions, and an assessment of available parking options within the vicinity of the site.

<u>On-Street Occupancy Data</u>

The on-street occupancy data should show how the on-street parking network is functioning in the study area. On-street parking on both public and private streets cannot be counted toward satisfying a site's parking requirement.

Existing on-street parking occupancy count days and times must be approved during the scoping process. On-street parking counts should be collected during peak occupancy periods for the site and/or surrounding neighborhood. The total amount of hours for collecting data is outlined in the table below. On-street parking counts are expected to be conducted on separate days over one week for medium sized developments and on separate days over two weeks for large sized developments. The following table details count requirements:

Small Studies				
	Office	**Residential**	**Retail**	**Restaurant**
Number of Survey Days	1	1	1	1
Number of Hourly Counts	2	2	2	2

Medium Studies				
	Office	**Residential***	**Retail**	**Restaurant**
Number of Survey Days	1	1 or 3	2	3
Number of Hourly Counts	2	3 or 9	8	8

Large Studies				
	Office	**Residential***	**Retail**	**Restaurant**
Number of Survey Days	2	2 or 6	4	6
Number of Hourly Counts	4	6 or 18	16	16

*If a medium or large study for a residential project falls within the vicinity of a significant amount of retail, additional counts on a Friday or Saturday may be required (as shown in the tables above).

Collection counts and hours for mixed use projects or uses that are not detailed in the table above shall be provided at the discretion of City staff and shall be agreed upon at the scoping meeting.

Comparable Development Data

Given the context of the site and/or use, an applicant may be required to provide parking occupancy counts for comparable developments—preferably within the City of Alexandria. A comparable site is defined as having the following similar characteristics as the proposed development:

- Land use and size
- Location in the City or in surrounding jurisdictions
- Distance to transit facilities such as metro stations and major transit hubs
- Number of transit facilities and amenities adjacent or near the site

The comparable development data must be collected within the last two years and should include the following for each site:

- Commercial: Existing total gross square footage for each land use type OR Existing number of employees
- Residential: The number of units for residential, hotel/motel, and live/work projects (OR) square footage
- Parking inventory information documenting type of space (tandem, compact, ADA, visitor, etc.)
- Peak parking utilization data indicating the time and date when the survey was taken
- Effective parking price (monthly, daily, hourly, etc.)
- Vacancy rates at the time of the parking count of all land uses using the parking

A secondary alternative to conducting occupancy counts at comparable sites uses parking ratio data and research to support the parking modification. Acceptable sources for parking ratio data:

- Previously accepted ratios by the City of Alexandria
- Urban Land Institute
- Parking generation ITE
- Other parking studies as approved by T&ES

Additional Parking Attributes
In addition to occupancy counts, the transportation study should document the following parking attributes.

- Number of on-street parking spaces
- Control of on-street parking (e.g., meters, signed restrictions, neighborhood residential permit parking, etc.)
- Number of off-street parking facilities and spaces (public and private) and hourly/daily costs
- Whether off-street parking is provided as independently-accessible stalls, tandem/stacked or valet operation

Parking Narrative
Within the text of the study, identify the effects of any special circumstances affecting the availability of parking in the vicinity of the proposed project (e.g., periods of peak parking demand and large generators of localized parking demand, such as a major institution, a large restaurant/bar, a large office building, etc.). Reference occupancy data, turnover data, peak conflict times, etc. as necessary.

Shared Parking Plan
Shared parking may be appropriate when land uses have different parking demand patterns and are able to use the same parking spaces. Shared parking is most effective in mixed use developments when land uses utilizing a parking facility have significantly different parking accumulation patterns.

For medium and large developments with compatible occupancies within mixed-use buildings or projects, the applicant is encouraged to consider shared parking as a means to reduce the total number of parking spaces. The applicant should include a shared parking analysis and plan in the transportation study.

A shared parking plan should at a minimum include the following, with details to be coordinated with T&ES:

- Type and mix of uses as well as peak parking demand by land use for all uses using the selected lot/garage for shared parking should be documented
- If the shared parking plan assumes use of an existing parking facility, then field surveys should be conducted to determine parking inventory and accumulation of selected lots/garages for shared parking
- If the shared lot/garage is located off-site, the shared parking plan could include one or more of the following:
  A. Plan of parking spaces intended for shared parking and their proximity to land uses that they will serve
  B. A signage plan that directs drivers to the most convenient parking areas for each particular use or group of uses (if such distinctions can be made)
  C. An efficient pedestrian circulation plan that shows connections and walkways between parking areas and land uses. These paths should be as direct and short as possible
- For large shared parking arrangements, a legally-binding shared parking agreement or contract between property owners detailing the access to, use of, and management of designated spaces.

Section 7 - Transportation Management Plans

Introduction

Transportation Management Plan (TMPs) are a set of specific strategies that influence travel behavior by mode, frequency, time, route or trip length to reduce single occupancy vehicle trips. TMPs help achieve an efficient and sustainable use of transportation facilities, and help attain larger City goals such as promoting access for all transportation system users, improving mobility, and minimizing the negative impacts of vehicular traffic. According to the City of Alexandria Zoning Ordinance, Article XI, Division B, Development Approvals, Section 11-700, a TMP may be required to implement strategies to persuade residents and employees to take public transportation, walk, and bike or share a ride, as opposed to driving alone.

TMP Coordinator

Each TMP must assign a TMP Coordinator and maintain current contact information with the Transportation Planning Division, including mailing address, phone number, and email address. The TMP Coordinator must work with staff in the City's Transportation Planning Division and have the authority, knowledge and capability to implement all aspects of the TMP. A TMP Coordinator is responsible for implementing the TMP as it is written once the project is built, usually six months to a year after completion of the project.

Duties of a TMP Coordinator include maintaining updated contact information with the Transportation Planning Division, distributing annual electronic surveys, managing and accounting the TMP fund, submitting reports to the City of Alexandria, and administering the program as defined by the TMP.

Program Components

Program components should be proposed by the applicant to meet the mode share goals. Every TMP should include a combination of the following program components to lessen vehicular traffic.

A. Transit Subsidies

• Discount the cost of bus and transit fare media (and the succeeding electronic fare media) for on-site employees and residents. The discounted bus and rail fare media should be sold or distributed to employees/residents of the project on-site during hours that are convenient for residents who work or dispersed to employees/residents electronically. The fare media to be sold or dispersed will include, at a minimum, fare media for Metrorail, Metrobus, DASH and any other public transportation system fare media requested by employees and/or the Transportation Planning Division. The availability of this fare media will be prominently advertised. At a minimum, the initial discount will be 50%.
• Provide one time free SmarTrip card to first time condominium purchasers and retail employees.

B. Carpool, vanpool and shuttle subsidies

Shuttle

• Provide shuttle service from the site to a Metrorail station, high capacity transit corridor station or bus transit center (i.e. Mark Center Transit Station). Details of the shuttle route, service frequency, and cost estimates should be provided. If this option is used for mitigation purposes, please contact WMATA and DASH to verify that this option is acceptable.

Carpool, vanpool and parking

• A parking management program, whereby a parking pricing policy could be established that favors HOV travel
• Monitor and enforce the use of reserved parking spaces for carpools and vanpools.
• Administer the Parking Management Program including reserving a specified number of free parking spaces for carpools and vanpools and for employees of the Staggered Work Schedule Program.
• Provide access to company fleet vehicles or car-share vehicles for employees who do not drive to work

Rideshare
• Create a ridesharing program that includes not only participation in the regional Metropolitan Washington Council of Governments Commuter Connections Program, but also site-specific matching efforts.
• Administer a ridesharing program, including signing people up for the City's Ridesharing Program, and assisting in the formation of 2-person carpools and vanpools of three or more persons. If a vanpool is established, it should be reported to the City and other necessary transit agencies.
• Purchase and lease vans to on-site tenants for vanpooling
• Set up contractual arrangements with private entrepreneur to provide vanpool service
Carshare
• Subsidize or pay for application fees for carshare vehicles for residents or employees who use alternative modes to work.

C. Marketing and projects
Guaranteed Ride Home
• Promote the regional Guaranteed Ride Home Program as part of the ridesharing and transit marketing efforts.
Telework
• Provide and promote on-site business center as a telework options for residential properties.
• Create and promote policies that allow for telework for commercial properties.
Marketing
• Distribute and display current marketing for transit schedules, rideshare applications and information, incentive information, etc. This can be on websites, newsletters, in the building lobby, in kiosks, advertising, at promotional events, in bus shelters, etc.
• Promote use of transit, carpooling/vanpooling and participation in the staggered work hour program and other components of the TMP with prospective tenants during marketing/leasing/sales activities and with both prospective and existing tenants and employees of the project.

D. Other
Transit
• Maintain bus shelters and similar amenities to enhance transit usage.
• Install transit information display, and keep current and clean.
Bicycling
• Install bicycle lockers, secure storage areas, covered parking, accessible and visible visitor racks, and provision of shower and changing facilities.
• Subsidize bikeshare memberships for residents or employees
• Contribute to bikeshare infrastructure or operations and maintenance expenses
Staggered Work Hours
• Administer a staggered work hour program including the promotion of the program among existing and prospective lessees, the registration of staggered work hour participants, issuing stickers and/or electronic cards to verify vehicles participating in the program and monitoring the program.
Regional Campaigns or Events
• Participate in Ozone Action Days and other regionally sponsored clean air, transit, and traffic mitigation promotions by advertising such promotions in a manner and at such locations within the building acceptable to the condominium association.
• Host events or participate in Bike to Work Day, Try Transit Week, and Car Free Day, Earth Day or other events with Local Motion.

Any other incentive activities as may be proposed by the applicant and approved by the Director of T&ES as meeting goals similar to those targeted by the required TMP measures. Transit, ridesharing, staggered work hours/compressed work week and the other program elements should be promoted to prospective residents and residents in the residential buildings.

Other TMP components

The following components should also be addressed in the TMP:

• Compliance and reporting requirements for the project based on the requirements in the Zoning Ordinance.

• TMP base fund rate for the present year and acknowledgment that the fund rate applicable to the project will be the TMP base fund rate at the time of the certificate of occupancy when the TMP becomes active.

• Estimated site population (number of expected employees and residents who work or live on site daily, respectively).

• Mode split goal based upon the transportation study results submitted by the applicant, taking into account the trip generation rates and modal reduction in addition to available census, COG and other modal split data.

• Statement of perpetuity that states "Any SUP granted by City Council under section 11-700, unless revoked or expired, shall run with the land and shall be mandatory and binding upon the applicant, all owners of the land and all occupants and upon all of their heirs, successors and assigns."

Section 8 – Summary of Submission Requirements

The following summary table details the suggested contents for an acceptable multimodal transportation study. To facilitate review, staff prefers that the information be provided in the order detailed below. Staff may require any of the elements listed below should the applicant not provide it, per the discretion of the City review team.

	Provide Information Graphically / Diagrammatically?	Electronic Table
List of Figures		
List of Tables		
Executive Summary		
Introduction		
Project Description		
Project Study Area (including study intersections site[s] and study limits)	x	
Methodology		
a) Site trip Generation		
b) Pass-by Trips		
c) Modeshare & Internal Capture with Justification		
d) Trip Distribution / Percentages	x	
Vehicular – Existing Conditions		
Existing Roadway Network & Cl		
Existing Capacity Analysis		
a) Lane Use and Traffic Control	x	
b) Peak Hour Turning Movement Counts and Daily Mid-Block Volumes	x	x
c) Levels of Service and Delay	x	x
Vehicular – Future Conditions without Development		
Planned Background Improvements (Roads/Streets/Bridges Etc.)		
Future Roadway Network		
Future Conditions Without Development Capacity Analysis		
a) Lane Use and Traffic Control	x	
b) Peak Hour Turning Movement Counts and Daily Mid-Block Volumes	x	x
c) Levels of Service and Delay	x	x
Vehicular – Future Conditions with Development		
Site Access		
Site Trip Generation		
Site Trip Distribution		
Future with Development Capacity Analysis	x	
d) Lane Use and Traffic Control	x	
e) Peak Hour Turning Movement Counts and Daily Mid-Block Volumes	x	x
f) Levels of Service and Delay	x	x
g) Signal / Turn Lane Warrant Analyses (as needed)	x	
Transit – Existing Conditions		
Existing Service Narrative		

Existing Transit Conditions Map	x	
Transit – Planned Conditions & Planned/Proposed Improvements with Development		
Planned Infrastructure & Infrastructure to be Provided by Applicant Narrative		
Planned Infrastructure & Infrastructure to be Provided by Applicant Map	x	
Bicycle and Pedestrian – Existing Conditions		
Existing Conditions Map	x	
Existing Pedestrian and Bicycle Volumes (medium and large studies only)	x	x
Existing Pedestrian and Bicycle Circulation	x	
Existing Conditions Narrative		
Bicycle and Pedestrian – Planned Conditions & Proposed Improvements with Development		
Planned Conditions & Infrastructure to be Provided by Applicant Map	x	
Planned Pedestrian and Bicycle Circulation	x	
Planned Conditions & Infrastructure to be Provided by Applicant Narrative		
Parking Analysis		
Overview of Streets Surveyed, Dates & Times		
Existing On-Street Parking Supply (shown for each study block)	x	x
Existing On-Street Parking Occupancy (shown for each study block)	x	x
Narrative on Impacts to On-Street Parking		
Preliminary Parking Management Plan – If Applicable		
Shared Parking Plan – If Applicable		
Transportation Management Plan		
Proposed TMP Strategies – If Applicable		
Multimodal Summary/Conclusion		
Proposed Mitigations Summary		
Conclusions		
Appendices		
Screening Form		
Scoping Agreement		
Existing Traffic, Pedestrian, and Bicycle Counts		
Background Development Traffic Assignments		
Parking Occupancy Counts		

Section 9 - Glossary

Washington Metropolitan Area Transit Authority - is a tri-jurisdictional government agency that operates transit service in the Washington, DC metropolitan area, including the Metrorail, Metrobus and MetroAccess.

Peak hour – The period of a single hour in the morning (a.m.), afternoon (midday), evening (p.m.) or Saturday during which the road system servicing the proposed use is most heavily utilized by motor vehicles other than those traveling to or from the proposed use. Traffic counts shall be summarized by 15 minute periods to identify peak hour.

Peak period – Weekdays, a three hour period from 6-10 a.m. and from 3-7 p.m. or Saturdays for two hours between 1-4 p.m. which the road system servicing the proposed use is most heavily utilized by motor vehicles other than those traveling to or from the proposed use. The peak period(s) to use for the transportation study will be determined during the scoping process.

Projected trips, total number of – The projected number of total person trips generated by the proposed use in a designated time period based on the size, type and intensity of the proposed use. The Institute of Transportation Engineers Trip Generation Manual 8th Edition, 2008 or other agreed upon method may be used to calculate projected trips.

Proposed project – A proposed use which consists of one or more buildings or structures and which may be constructed in phases over time.

Proposed use – A use which is described in an application for a special use permit filed under Section 11- 700.

Transit subsidies – The provision of cash reimbursement or payment and/or transit fare media (e.g. tickets, tokens, passes) to tenants and occupants of a building to encourage their use of public transit.

Transportation Management Plan – A comprehensive, coordinated and continuously operated plan submitted as part of an application for a special use permit under Section 11-700 which demonstrates the administrative activities, the physical facilities and the operational, financial and other commitments which will be undertaken at or in conjunction with a proposed use in order to reduce the traffic and related impacts of the proposed use.

Useable square feet – Floor area of a proposed use, which shall be the sum of all gross horizontal areas under a roof or roofs of all buildings or structures comprising a proposed use, computed by measuring from the exterior face – of walls and from the eaves of all roofs where they extend party walls, and which shall include all space with a headroom of seven feet six inches or more, whether or not provided with a finished floor or ceiling. Excluded shall be elevator and stair bulkheads. No deduction shall be made for columns and projections necessary to the building structure.

Unfactored ITE rates – Using trip generation rates from the ITE's Trip Generation Manual without any reductions, including pass-by trips, internal capture, mode splits or existing land uses on the development site.

Transportation Study – A transportation study can be a short transportation review or a comprehensive study, referred to as a transportation study in this document.

Trolley – a free service which provides access for visitors, residents, and those who work I the City to accommodations, attractions, restaurants, and shops within the City.